

19991028.ba v02\_n713.bam.991028

>From ???@??? Thu Oct 28 08:24:41 1999  
Message-Id: <199910280510.d9S5AtT08258@sco.theporch.com>  
Date: Thu, 28 Oct 1999 00:10:17 CDT  
From: Old Tube Radios <boatanchors@theporch.com>  
To: Old Tube Radios <boatanchors@theporch.com>  
Subject: BOATANCHORS digest 2713

BOATANCHORS Digest 2713

Topics covered in this issue include:

- 1) HQ-170  
by "Owens, Clarence" <clare.owens@otis.com>
- 2) Re: Lafayette HA-350  
by Al Klase <skywaves@bw.webex.net>
- 3) Re: Asbestos Hazard in BAs?  
by Arden Allen <gumbear@pacbell.net>
- 4) Sound Ranging  
by Andre Guibert <aguibert@sympatico.ca>
- 5) xtal available  
by Paul Nelson <drhydro@ames.net>
- 6) BoatAnchor Styled MICS for Sale.....  
by Robert Ross <robross@odyssey.on.ca>
- 7) Re: Sound Ranging  
by Jderm740@aol.com
- 8) Kokusai filters - was: Re: Lafayette HA-350  
by John Kolb <jlkolb@cts.com>
- 9) Re: WTB HAM-M rotator  
by Roy Morgan <roy.morgan@nist.gov>
- 10) WTD: UV201 Tubes  
by "David L. Stinson" <arc5@ix.netcom.com>
- 11) Re: WTD: UV201 Tubes  
by William Donzelli <aw288@osfn.org>
- 12) Re: Your new HA-350  
by "Mark Shaum" <k9tr@mtco.com>
- 13) KW Electronics manuals UK  
by thompson@mindspring.com
- 14) Pentode Regenerative Detectors (long)  
by NBroline@aol.com

-----  
Content-return: allowed

Date: Tue, 26 Oct 1999 18:21:50 -0400  
From: "Owens, Clarence" <clare.owens@otis.com>  
Subject: HQ-170  
To: Old Tube Radios <boatanchors@theporch.com>

Message-id: <0FK800I19E8F4Z@mailman.otis.com>

MIME-version: 1.0

Content-type: text/plain

Hi Fellow Anchorites,

I have an HQ-170 that I would like to trade for a Johnson 275W matchbox. The 170 is in nice mechanical shape and is working and I would like a Matchbox in good original condition and working. I'm willing to assume equal value for each although I'm quite sure that the usual HQ-170 sells for more than the usual 275W Matchbox. However, because the two differ so much in shipping costs, I'd like either to arrange for a meeting to swap them (I'm in Bloomington, IN) or be compensated for the UPS charges for the 170. I have double wall boxes and urethane and polyethylene foam packing to use for shipping the 170, so there won't be any packing cost. I'll fill the interior of the 170 with bubble wrap to keep the tubes in place.

I'm after this Matchbox for my son because my 275W Matchbox works so well with ladder line or coax without having to use a balun. If there are any other "tuners" out there that will do as well without a balun, I might consider one of them, but I'd really like a Johnson.

HQ-170 details:

Cabinet and front panel are very good, no dents or corrosion. The natural finish metal around the edge of the front panel is somewhat darkened. The clock is there and looks really good; the plastic housing is clear and the clock face is clean. The previous owner disconnected one wire from the clock motor. I reconnected it temporarily and the motor vibrates but does not turn. So it's disconnected again. The freq dials are clean and nice. The vernier tuning may have been repaired/modified but it seems to work OK. The chassis cleaned up very well with a cotton sock and Q-tips using plain water except where I had to use Acetone on the residue from the masking tape he'd used to hold the 100Kc crystal in place. It has many tiny dark marks but overall it is shiny. Under the chassis everything looks original and very clean except the vernier tuning variable cap, which is clean but maybe not original. Also the power supply has been solid stated using two wirewounds under the chassis and a commercial looking rectifier in a tube base. All the small caps are disk ceramics and appear to be factory original.

I've had it running for about an hour and it seems to be OK on SSB and AM; I listened on 10M and 20M. I didn't try to tune in any CW stations. The calibrator works.

73,

Clare Owens N2RJB

n2rjb@arrl.net

-----  
Message-ID: <38162C76.5817168A@bw.webex.net>  
Date: Tue, 26 Oct 1999 18:34:30 -0400  
From: Al Klase <skywaves@bw.webex.net>  
MIME-Version: 1.0  
To: Old Tube Radios <boatanchors@theporch.com>  
CC: Old Tube Radios <boatanchors@theporch.com>,  
"Richey, Jim - WA4URR" <jimwa4urr@juno.com>  
Subject: Re: Lafayette HA-350  
Content-Type: text/plain; charset=us-ascii  
Content-Transfer-Encoding: 7bit

Anchorites,

I restored one of these receivers a couple of years ago, and encountered a problem that you might want to hear about. The Kokusai (sp?) 455KHz mechanical filter seemed not to work very well. It had a lot of loss and kinda indistinct selectivity. I opened it up (Just bend the tabs and remove the cover.) to discover that the plastic (urethane?) foam used to mount the filter element had decomposed into a hard gooey substance that was caked on the filter disks. It wasn't hard to imagine that this was messing up the mechanical resonances. I carefully unsoldered the two fine wires from each end of the element and removed it from the base. I was able to remove the goo with paint remover. Milder solvents didn't do much. I rewrapped the element loosely in polyethelene foam and reassembled the filter. The filter proved to work just fine. The PE should be stable in the long run. If you can't find some let me know and I'll mail a chunk.

Proceed with care as the filter is the heart of this receiver.

Your mileage may vary,  
Al

--  
Al Klase - N3FRQ  
skywaves@bw.webex.net  
Flemington, NJ 08822  
Web Page: <http://www.webex.net/~skywaves/home.htm>

-----  
Date: Tue, 26 Oct 1999 17:28:11 -0700  
From: Arden Allen <gumbear@pacbell.net>  
Subject: Re: Asbestos Hazard in BAs?  
To: Old Tube Radios <boatanchors@theporch.com>  
Message-id: <0FK800C7JK2PMT@mta2.snfc21.pbi.net>  
MIME-version: 1.0  
Content-type: text/plain; charset=ISO-8859-1  
Content-transfer-encoding: 7bit

Hello Niel;

With regard to asbestos as a hazard. It's about as hazardous as water, IMO, notwithstanding all the hysteria engendered by the media and the lawyers. Asbestos occurs naturally and is mined from the earth. The fibers are not toxic as with a chemical poison. The body just is not able to expel or absorb the fibers and perhaps the body's attempts to deal with the irritation leads to cancer in some folks. It takes a lot of exposure over an extended period of time to produce a serious likelihood of disease I would surmise from what I've learned about asbestos. Common sense is the correct approach. Your idea of stabilizing the material by encapsulating it with a varnish is certainly prudent. If you have to remove the material, wet it with an oily, waxy liquid like furniture polish as you remove it and place it in a plastic bag. Of course, to feel safe, you will want to avoid breathing any airborne dust you may accidentally create. Stick the asbestos containing material with all your other "hazardous" disposables for the day when you make a trip to the hazardous materials disposal station, compliments of your friendly local waste management folks. Safety, health and environmental conscientiousness is not to be laughed at, it means you are considerate of your planetary cohabitants.

Arden Allen KB6NAX Vallejo, CA gumbear@pacbell.net

-----  
Date: Tue, 26 Oct 1999 22:39:31 -0400 (EDT)  
Message-Id: <1.5.4.16.19991026223031.26cf2b72@pop1.sympatico.ca>  
Mime-Version: 1.0  
Content-Type: text/plain; charset="us-ascii"  
To: Old Tube Radios <boatanchors@theporch.com>  
From: Andre Guibert <aguibert@sympatico.ca>  
Subject: Sound Ranging

Bonsoir Robert and All

Your answer is a bit on the Bikini side, what it shows is good but what it hide is even better.

Would like to have an idea as to the working of the whole system, was it like the Brits with five tx. and a five

channel printer in the back line?  
Each posts had a second tx/rec for inter comm. to identify  
the shots.  
Andre

Andre Guibert  
aguibert@sympatico.ca

-----  
Mime-Version: 1.0  
Message-Id: <v04210100b43c2b452d97@[208.142.211.162]>  
Date: Tue, 26 Oct 1999 23:13:45 -0500  
To: Old Tube Radios <boatanchors@theporch.com>  
From: Paul Nelson <drhydro@ames.net>  
Subject: xtal available  
Content-Type: text/plain; charset="us-ascii" ; format="flowed"

Hokay, guys-  
I got a crystal that sez:  
FT-249  
FREQ. A  
3770 KC  
IN T-4/FRC

AFD 2200

It's free for shipping (a \$5 bill works) to anyone who wants it...  
rules of Ware apply!

I don't know whether it's active or not... looks clean.  
Paul Nelson W5GNF "When I go, I want to go quietly, in my  
Ames, Iowa sleep, like my grandfather- not  
screaming, like his passengers."  
(DrHydro@ames.net)  
Cessna 140 N77149 "More hay, Trigger?"  
"No thanks, Roy, I'm stuffed."

-----  
Message-Id: <3.0.32.19991027002810.006d36cc@mail.odyssey.on.ca>  
Date: Wed, 27 Oct 1999 00:28:20 -0400  
To: Old Tube Radios <boatanchors@theporch.com>  
From: Robert Ross <robross@odyssey.on.ca>  
Subject: BoatAnchor Styled MICS for Sale.....  
Mime-Version: 1.0  
Content-Type: text/plain; charset="us-ascii"

Hello:

I have the Following Microphones for Sale.....

Please email me direct at..... robross@odyssey.on.ca to reserve any of these Mics.

All Prices are in USA Dollars...and Shipping is Extra.

73...ROB VA3SW

#####  
#####  
Electro-Voice Microphone Model # 605. Chrome Bullet Mic 50 Ohms. Entire Mic Head is Chrome....which is very Nice Condition....9 out of 10. Comes with Plug to Mic....but no Cord. Also comes with a Nice Smaller sized Chrome Stand and Base.....Everything is CHROME...and in Nice Shape!! This is a COOL Looking Mic that will accent any Boatanchor Station.....

VG++ Cond.

PRICE.....\$50.00 USA  
#####  
#####  
ElectroVoice Microphone Model # 641. Dynamic Mic 150 Ohms. Smaller Sized Shotgun Shaped Mic. Front Half of the Mic is Chrome....the Back half is Grey Painted Metal. The Neck of the Mic is Chrome. Has an ON-OFF switch on Top. Overall Condition is an 8 Out of 10...with a 1/2 Scratch on the Chrome Neck. Comes with Plug to Mic, and Cord...no Plug for Radio.

Another Nice Boatanchor Mic by Electro-Voice.

VG+ Cond

PRICE.....\$35.00 USA  
#####  
#####  
Electro-Voice Microphone Model 664. Chrome Shotgun Mic. This is the One everyone wants for their Collins Station!!This Mic is about a 5-6 Out of 10....mainly due to the Condition of the Chrome....as it is somewhat Corroded. This is not a Beauty....but it's not a dog either. Fully Funtional.....and Bargain Priced! Comes with Cord...and 2 Plugs. This is the Model with the BLACK NamePlate.

Good Cond.

PRICE.....\$30.00 USA

#####  
#####

Astatic Model 77 Microphone. Large sized Chrome "Elvis Type" styled Mic!!  
This is similar  
to the Shure Model 55s Elvis.....not exactly...but quite similar. Large  
Chrome Head that is  
rounded at the back..and flat at the front. Great Deco styling with tilting  
Head. This is the  
Canadian Version of this Mic. The chrome on this is EXCELLENT!!!!...A Real  
Beauty. Everything  
on this mic is Chrome..except the Nameplate!! Comes with Chrome Stand and  
Black wrinkle Heavy  
Metal Base. You won't find any nicer....or neater looking for your  
boatanchor desk. Wouldn't  
sell this if I didn't have another one!!

EXC. Cond.

PRICE.....\$90.00 USA

#####  
#####

Electrovoice Model 630 Chrome Bullet Microphone. Serial # 20521. Classic  
Chrome Mic  
Looks and works great with an Old Boatanchor station. Chrome is Very  
Good...no Pitting,  
but there is some minor gouges on the side of the Mounting area...not on  
the Mic part.  
Still displays very well. Also included is a Chrome Mounting Support with  
Brown Painted  
Metal Base. No Plug or Cord.....

VG Cond overall.

PRICE.....\$30.00 USA

#####  
#####

Astatic Model DN-HZ Chrome Faced Bullet Microphone. Great looking Bullet  
Mic!! Main body  
of the Mic is Hammertone Grey Painted...the front Grill is Chrome.....great  
deco look  
with Vertical Grill Bars. Complete with Cord and Plug. Has Nice Chrome  
mounting Support,  
and Heavy Grey Wrinkle Painted Base. Cool looking Mic...Great Deco Styling!

Chrome and Paint are both Excellent!

VG+++ Cond....real nice.

PRICE.....\$50.00 USA

#####  
#####

Astatic Model 10C Chrome Faced Bullet Microphone. Similar to the above mic in Looks...but

a little smaller. Main body of the mic is Grey Hammertone Painted....front Grill is

Chrome.....with both Vertical and Horizontal Bars....again..another cool looking Mic.

Chrome is Excellent....Paint is a VG+..a few Scuffs.

Complete with cord and 4 Pin Plug. Also has a Wooden mounting support and Grey hammertone

Metal base.

VG+ Cond.

PRICE.....\$40.00 USA

#####  
#####

ElectroVoice Microphone Model # 630 Dynamic Omni-Directional. Chrome Bullet Mic. Entire Mic

Head and Neck of Mic is Chrome. Red EV Logo Plate. Great Looking Chrome Bullet to Accent your

Boatanchor Station. No Stand or Cord.

VG++ Cond...Real Nice.

PRICE.....\$40.00 USA

#####  
#####

ElectroVoice Microphone Model # 630 Dynamic Omni-Directional. Chrome Bullet Mic.

Same Mic as above....but this has the BLACK EV Logo Plate.

No Stand or Cord.

VG++ Cond....Real Nice.

PRICE.....\$40.00 USA

#####  
#####

Astatic JT-30 Bullet Mic. This is the CANADIAN MADE Version from Toronto!! Classic

Bullet Shaped Mic.....sought by Harp Players and Boatanchor Users! Grey Hammertone



Paint with Chrome front Grill. Very DECO Looking. Comes with Cord and Plug...No Stand.

VG+ Cond.

PRICE.....\$40.00 USA

#####  
#####

Electrovoice Model 664 Chrome Shotgun Microphone. This is the One that everybody wants for their Boatanchor/Collins Station. Classic Chrome Shotgun.....with Nice Chrome Metal Mesh grill.  
Has 3 rectangular Cutouts on each side of mic....and this is the early Model with the Black Nameplate. Ser. # is 182697. Chrome on the Mic is VG+.....except for the Mounting Frame...which looks like it has had an Engraved Name ground off. Some of the chrome has been ground off the side of the frame. Actual Mic is Very nice. No Base or Cord. No Stand.

VG Cond. Overall.

PRICE.....\$50.00 USA

#####  
#####

Electrovoice Model 664 Chrome Shotgun Microphone. As Above....This is the One that everybody wants for their Boatanchor/Collins Station. Classic Chrome Shotgun.....with Nice Chrome Metal Mesh grill.  
Has 3 rectangular Cutouts on each side of mic....and this is the early Model with the Black Nameplate. Ser. # is 19777. Chrome on the Mic is VG+.....except for the Mounting Frame...which has a Name Engraved on it ( Southeast Christian Church)....so not only is this a Nice looking MIC, It has also been Blessed!!  
Very nice....except for Engraved Name!! No Base or Cord. No Stand.

VG Cond. Overall.

PRICE.....\$50.00 USA

#####  
#####

-----  
From: Jderm740@aol.com

Message-ID: <0.eacc75a1.2547dbe1@aol.com>  
Date: Wed, 27 Oct 1999 00:38:57 EDT  
Subject: Re: Sound Ranging  
To: Old Tube Radios <boatanchors@theporch.com>  
MIME-Version: 1.0  
Content-Type: text/plain; charset="us-ascii"  
Content-Transfer-Encoding: 7bit

Hi

I have been reading about sound ranging electronically and I'm sure it was very quick and accurate but here in Long Island Sound the Coast Guard had a system of sound ranging for boats that was quite simple. This was before everything went so high tech.

You needed a chart. A LF receiver and a stop watch. The chart would tell you which radio beacons were range beacons. These beacons also had fog horns synchronised to the keying of the call letter of the beacon. You tuned these in on your LF and with your stop watch at the ready, at the first keying of the beacon you started the watch and when you heard the fog horn you stopped the watch, noted the elapsed time and calculated the distance from the beacon. A lot like lightning flashes versus thunder for distance measuring from the storm.

If you heard the call letter and the the horn right away you reached for the reverse gear as fast as you could. A life vest wasn't a bad idea either.

Jack

-----  
Date: Tue, 26 Oct 1999 23:45:15 -0700 (PDT)  
From: John Kolb <jlkolb@cts.com>  
To: Old Tube Radios <boatanchors@theporch.com>  
cc: Old Tube Radios <boatanchors@theporch.com>,  
"Richey, Jim - WA4URR" <jimwa4urr@juno.com>  
Subject: Kokusai filters - was: Re: Lafayette HA-350  
Message-ID: <Pine.BSI.4.05.9910262342350.3761-100000@king.cts.com>  
MIME-Version: 1.0  
Content-Type: TEXT/PLAIN; charset=US-ASCII

On Tue, 26 Oct 1999, Al Klase wrote:

> about. The Kokusai (sp?) 455KHz mechanical filter seemed  
> not to work very well. It had a lot of loss and kinda  
> indistinct selectivity. I opened it up (Just bend the tabs  
> and remove the cover.) to discover that the plastic  
> (urethane?) foam used to mount the filter element had  
> decomposed into a hard gooey substance that was caked on the

> filter disks. It wasn't hard to imagine that this was  
> messing up the mechanical resonances. I carefully  
> unsoldered the two fine wires from each end of the element  
> and removed it from the base. I was able to remove the goo  
> with paint remover. Milder solvents didn't do much. I  
> rewrapped the element loosely in polyethelene foam and  
> reassembled the filter. The filter proved to work just  
> fine. The PE should be stable in the long run. If you can't

Had the same problem with the Kokusai filter in a Yeasu  
FRdx400, and have heard of several others. Packed mine  
in cotton after cleaning.

John

-----  
Message-Id: <199910271417.d9REH8T11116@sco.theporch.com>  
Date: Wed, 27 Oct 1999 10:17:17 -0400  
To: Old Tube Radios <boatanchors@theporch.com>  
From: Roy Morgan <roy.morgan@nist.gov>  
Subject: Re: WTB HAM-M rotator  
Cc: Old Tube Radios <boatanchors@theporch.com>  
Mime-Version: 1.0  
Content-Type: text/plain; charset="us-ascii"

>From: "Ed Santavicca" <santavic@ct.picker.com>  
>

>Does anyone have an extra Ham-M rotator control box they would like to  
>sell? A friend of mine has one and it's dead.

Contact Norma Rotor Service in (nearby) Frederick MD.  
He offers a great exchange service on rotors at VERY reasonable prices  
(\$50 plus parts).  
The web page is:

<http://web.compuser.net/shiacawn/rotors/>

He lists the Ham-M control box for \$65.

Roy

- Roy Morgan  
Keep em glowing! K1LKY since 1959  
7130 Panorama Drive, Derwood MD 20855  
301-330-8828

-----  
Message-ID: <3817987A.443D568D@ix.netcom.com>  
Date: Wed, 27 Oct 1999 19:27:39 -0500  
From: "David L. Stinson" <arc5@ix.netcom.com>  
MIME-Version: 1.0  
To: Old Tube Radios <boatanchors@theporch.com>  
Subject: WTD: UV201 Tubes  
Content-Type: text/plain; charset=us-ascii  
Content-Transfer-Encoding: 7bit

I need two UV-201 tubes so I can bring my BC-9 to life.  
These are very early triodes with four short pins.  
Don't have to be "new," but do need to be "good."  
I have lots of trading materials.

thanks,  
Dave Stinson  
arc5@ix.netcom.com

-----  
Date: Wed, 27 Oct 1999 21:55:08 -0400 (EDT)  
From: William Donzelli <aw288@osfn.org>  
To: Old Tube Radios <boatanchors@theporch.com>  
cc: Old Tube Radios <boatanchors@theporch.com>  
Subject: Re: WTD: UV201 Tubes  
Message-ID: <Pine.SUN.3.91-FP.991027215119.14666B-100000@osfn.org>  
MIME-Version: 1.0  
Content-Type: TEXT/PLAIN; charset=US-ASCII

> I need two UV-201 tubes so I can bring my BC-9 to life.  
> These are very early triodes with four short pins.  
> Don't have to be "new," but do need to be "good."  
> I have lots of trading materials.

VT-1s, man...do it right!

Anyway, UV-201s are closing in on the street price of VT-1s.

What order was your BC-9 built on?

William Donzelli  
aw288@osfn.org

-----  
Message-ID: <002501bf20f0\$94907c00\$82209bd0@cpq5170>  
From: "Mark Shaum" <k9tr@mtco.com>  
To: Old Tube Radios <boatanchors@theporch.com>

Subject: Re: Your new HA-350  
Date: Wed, 27 Oct 1999 22:00:04 -0500  
MIME-Version: 1.0  
Content-Type: text/plain;  
charset="iso-8859-1"  
Content-Transfer-Encoding: 7bit

Regarding a message from: hikrbikr@erols.com (Mike)

Subject: Lafayette HA-350

Mike,

I picked up a HA-350 about a year ago at one of the Central Illinois hamfests. I remember it catching my eye in the mid 60's Lafayette catalogs, as a very modern looking (as in S-line or Heath SB-line) receiver with mechanical filter selectivity for only \$189.. never actually played with one until I found my current unit last year. Almost spent my paper route money on one, but eventually went for a SB-301, with no regrets.

Comments: Trio/Kenwood built for Lafayette. Rugged mechanical construction. Front end design very similar to the Drake 2B, in that the basic receiver covers 3.5-4.1 Mhz with front end conversion from other bands. And yes, it has a 2.1 khz mechanical filter, not a name brand unit though. Lafayette advertised the "import" mechanical filter for separately in their advertising as I recall for \$19.95. Works fine, great bandwidth for SSB and casual CW. Stable oscillators to match the mechanical construction. No real frills, but has internal calibrator.

Drawbacks: Mainly the overly fast tuning ratio. 100 khz plus per knob turn. But smooth without backlash, so it's somewhat livable. AGC doesn't suit me time constant wise for SSB or CW, but again, for less than 200 bux in 1965.. Has only one selectivity option, the 2.1 khz bw filter. Very limiting on AM, but at least an AM detector was included! Power tranny runs rather warm.

EZ modifications: CQ February 1966 - "Adjustable selectivity for the HA-350". Adds a few wider BW steps by switching small value capacitors in parallel with the mechanical filter in/out pins. It is effective, as a nice 4-5 khz wide double-hump response can be obtained for AM use. My 350 actually had this modification installed by a previous owner.

More difficult modification: I want to look into adding one of my Jackson bros. verniers to the drive assembly. The fast tuning rate pretty limits the use in my shack to parking it on 10m and using it to quickly scan the window between 29.0 and 29.1. Maybe a winter '99 2nd tier project.

Too bad a matching transmitter was never developed, probably due to the cost

factor attempting a working low-end SSB/CW rig. The '350 frequently gets more comments from shack visitors than my other junque, probably due to the nice brushed aluminum/chrome trim front panel.

If you don't get a lead on a manual, drop me a note, I'll copy my copy of a copy.

73! - Mark

-----  
Mark Shaum K9TR  
email: k9tr@mtco.com  
http://www.mtco.com/~k9tr  
Central Illinois Grid EN50ii Zip 61721  
-----

-----  
From: thompson@mindspring.com  
Message-ID: <000901bf20fc\$30c00040\$332856d1@default>  
To: Old Tube Radios <boatanchors@theporch.com>  
Subject: KW Electronics manuals UK  
Date: Thu, 28 Oct 1999 00:23:25 -0400

There have been several requests for KW2000 and other KW Electronics manuals.

The best source is Mauritron Technical Services in the UK.

Their web page is [www.mauritron.co.uk](http://www.mauritron.co.uk) e-mail to [manuals@mauritron.co.uk](mailto:manuals@mauritron.co.uk)

Dave K4JRB

-----  
From: NBroline@aol.com  
Message-ID: <0.ce48146c.2549348c@aol.com>  
Date: Thu, 28 Oct 1999 01:09:32 EDT  
Subject: Pentode Regenerative Detectors (long)  
To: Old Tube Radios <boatanchors@theporch.com>  
MIME-Version: 1.0  
Content-Type: text/plain; charset="us-ascii"  
Content-Transfer-Encoding: 7bit

This has been a great thread! I have a couple of observations regarding the regen detector that we all need to think about in terms of how it works. Perhaps this is a relatively simple minded way of looking at it, but it seems, on the surface to be mildly credible.

First, assume that the detector is at the critical point --- 1/1000th a hair's breath of oscillation.

The parallel impedance of the detector coil is (almost) at infinity because it has no loss--the amplifier is compensating for all losses from all sources.

The bandwidth is (almost) at zero (since  $F_o/Q = 0$  when  $Q = \text{infinity}$ ).

The voltage gain of the antenna circuit/detector coil is as good as it will ever get, as the detector coil presents no load on the antenna circuit (or previous RF amp plate circuit) because the parallel impedance of the detector coil is  $R_p = X_c \times Q = \text{infinity}$ . Even if we're very loosely coupled, the voltage on the detector grid is identical to the open circuit voltage on the antenna at the tuned frequency only.

The RF gain of the tube at this point is whatever it takes to make the loop gain approach unity (1), and we are really at about 0.999999999.... at our ideal point. Notice that the RF feedback ratio is generally pretty high--anywhere from about 1/4 (lots of coupling) to maybe 1/20 (very small coupling). (Here I am taking the feedback ratio as the ratio between the RF output and that portion getting back to the grid.) So, by inspection, we can say that the amplifier's RF gain is going to be somewhere between maybe 4 to 20, which is not a large amount of gain or gain difference. In fact, we can say that that RF voltage on the grid is not any greater than it would be in an open circuit antenna, because we are not at the point where we are putting out more into the antenna than we are getting in. Seems to me we are, at this point and at this very narrow frequency band, "invisible" to the antenna or earlier circuit.

Sounds like this is the ultimate grid leak detector. We have a coil with infinite  $Q$  that is perfectly coupled to the antenna, we are operating at zero bandwidth, and we have the tube operating somewhere in its operating region where it has some reasonable gain at the RF frequency.

Now we must think of the detector as an audio amp. The gain is established by the  $g_m$  of the tube at the operating point set by the RF gain requirement times the effective plate load at audio frequencies--which many designs make very large with the 500 H. choke as the load (remember that 500 H has about 3 megs of reactance at 1 kc.). Our audio gain is about 1200 for a tube with 400 umhos. If we use a 1:3 transformer, it is now 3600 at the grid of the next stage. Bottom line, we have the greatest part of the system gain in the audio amplifier function.

Now go back and adjust this "infinite  $Q$ " assumption with a bit of reality. A good regen detector can produce a very muffled audio response characteristic of, say, 500 cycle bandwidth. This implies an operating  $Q$  of about 1 Mc./500 = 2000 or so, which is about 20 times greater than the  $Q$  we'd get from a credible detector coil loaded  $Q$  of 100 with no positive feedback. The gain of the amplifier is unchanged by the coil  $Q$  assumption, so now let's look at the overall gain. We got an improvement of about 20 from the input coupling

factors, about 3600 from the audio circuit, for a whopping gain of 72,000 (97 dB!). If we apply a credible weak signal of, say, 20 microvolts, we get about 1.4 volts rms to the next grid. Is that credible, or at close enough to be within an order of magnitude of correct??? Intuition tells me it's at least worth talking about.

We can continue drawing some more conclusions about our detector....

Maybe it doesn't matter which tube type we use as a detector--sharp or remote cutoff--because we're going to adjust its gain to a reasonable point to achieve both RF and audio gain. We do know that the pentode is going to have a large audio gain compared to any triode.

Perhaps the amount of RF feedback (the feedback ratio) does not affect the overall detector operating gain unless we are controlling the DC operating point of the tube to control RF gain. This would say that the throttling capacitor is useful in separating the audio gain parameters from the RF parameters.

Performance is not limited to a single tube circuit, where the RF feedback occurs the same circuit element as the audio amplification does. A "Q-multiplier" 2-tube circuit appears in the late 30's in QST, and the 1966 ARRL (and many more) handbook uses a dual transistor (pardon the expression) rendition.

Perhaps the "smoothness" of operation is related to the sensitivity of the tube's RF operating point to external voltage changes. Maybe the remote cut-off has an advantage here? Of course, the sharp cut-off can be operated down at a low voltage point where it's not a screamer, either.

Clearly the stability of the operating point is worth putting some effort into.

If, in fact, we can achieve a circuit where changes in the tube's RF operating point, like when transitioning into oscillation, produces no dc changes, we most likely have a pretty good detector. With dc changes, I would suggest we'll get hysteresis, and real cranky performance at best.

As a point of reference, H.A. Robinson in QST, February, 1933, measured "detector gains" of about 7500 based on the ratio between the plate output swing vs. the antenna input level of a 30% modulated signal. Correct to a 100% modulated signal, and the detector gain is 25,000. Add a 1:3 transformer, and you get 75,000 gain from Mr. Robinson's circuit tests. However, Mr. Robinson used a 100K plate load resistor, not a 500 H choke. Any relation of my WAG numbers are strictly coincidental--there was no contrivance on my part. Mine are WAGs, Mr. Robinson got his the hard way--he measured them. The reason I used numbers was only to help bound the gains and circuit elements and help us place a sanity check on the various gain contributors. Mr. Robinson also measured many selectivity curves vs.



operating point that are very impressive as well.

So, is there anything new under the sun?????

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End of BOATANCHORS Digest 2713

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